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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,343	08/19/2003	Craig S. Calvert	PM 2002.001	3824

7590 05/24/2007  
EXXONMOBIL UPSTREAM RESEARCH COMPANY  
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EXAMINER
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SHARON, AYAL I

ART UNIT	PAPER NUMBER
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2123

MAIL DATE	DELIVERY MODE
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05/24/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/643,343

**Applicant(s)**

CALVERT ET AL.

**Examiner**

Ayal I. Sharon

**Art Unit**

2123

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 8/19/2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Introduction***

1. Claims 1 and 3-19 of U.S. Application 10/643,343, originally filed on 8/19/2003, have been presented for examination.
2. Claim 19 is new. Claim 2 has been cancelled.

### ***Continued Examination Under 37 CFR 1.114***

3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/12/2007 has been entered.

### ***Drawings***

4. Figure 6A is objected to for lack of legibility. Formal drawings will be required when the application is allowed.

### ***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. **Claims 1 and 3-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**
7. The Examiner respectfully submits that under current PTO practice, the claimed methods do not recite *either a useful or a tangible result*.
8. The fundamental test for patent eligibility is to determine whether the claimed invention produces a **“useful, concrete and tangible result.”** See State Street Bank & Trust Co. v. Signature Financial Group Inc., 149 F. 3d 1368, 47 USPQ2d 1596 (Fed. Cir. 1998) (producing a final share price) and AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352, 50 USPQ2d 1447 (Fed. Cir. 1999) (producing a a primary inter-exchange carrier ("PIC") indicator). In these decisions, the court found that the claimed invention as a whole must accomplish a practical application. That is, it must produce a “useful, concrete and tangible result.”
9. The test for practical application as applied by the examiner involves the determination of the following factors:
  - a. **“Useful”** – According to MPEP § 2106 (IV)(C)(2)(2)(a), the USPTO's official interpretation of the utility requirement provides that the utility of an invention has to be (i) specific, (ii) substantial and (iii) credible. MPEP § 2107 and In re Fisher, 421 F.3d at 1372 (citing the Utility Guidelines with approval for interpretation of “specific” and “substantial”). In addition, when the examiner has reason to believe that the claim is not for a practical

application that produces a useful result, the claim should be rejected, thus requiring the applicant to distinguish the claim from the three 35 U.S.C. 101 judicial exceptions to patentable subject matter by specifically reciting in the claim the practical application.

- b. **"Tangible"** - Applying In re Warmerdam, 33 F.3d 1354 (Fed. Cir. 1994), the examiner will determine whether there is simply a mathematical construct claimed, such as a disembodied data structure and method of making it. If so, the claim involves no more than a manipulation of an abstract idea and therefore, is nonstatutory under 35 U.S.C. § 101. In addition, According to MPEP § 2106 (IV)(C)(3), a claim that recites a computer that solely calculates a mathematical formula, or a computer disk that solely stores a mathematical formula, is not directed to the type of subject matter eligible for patent protection. Gottschalk v. Benson, 409 U.S. 63 (1972).
- c. **"Concrete"** - According to MPEP § 2106 (IV)(C)(2)(2)(a), a claimed process must have a result that can be substantially repeatable, or the process must substantially produce the same result again. In re Swartz, 232 F.3d 862, 864 (Fed. Cir. 2000) (finding that an asserted result produced by the claimed invention is "irreproducible" claim should be rejected under section 101). The opposite of "concrete" is unrepeatable or unpredictable. An appropriate rejection under 35 U.S.C. § 101 should be

accompanied by a lack of enablement rejection, because the invention cannot operate as intended without undue experimentation.

10. The claimed subject matter does not produce a useful or tangible result:

- a. A **"Useful"** result is missing because the claimed result fails to sufficiently reflect at least one practical utility set forth in the descriptive portion of the specification.

### ***Claim Rejections - 35 USC § 112***

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 1, and 3-19 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01.

13. The omitted steps are: the steps that recite how the results from the spectral simulations are used to update the tentative models.

### ***Response to Arguments***

#### **Re: Claim Rejections - 35 USC § 101**

14. The examiner agrees with applicants' arguments (see p.2 of the amendment filed 4/12/07) that the amended claims produce a tangible result because the method

is computer-implemented, and the claimed "spectral simulation" step performed in a computer implies a tangible storage of the information within the computer.

15. On the other hand, the examiner disagrees with applicants' argument that the claims recite a useful result. It is not clear from the limitations of claims 1 and 3-18 what constitutes the results of the spectral simulation. This differs for the specific, substantial result in State Street (a final share price) and in AT&T a primary inter-exchange carrier ("PIC") indicator). Only dependent claim 19 recites what appear to be specific, substantial results.

Re: Claim Rejections - 35 USC § 112

16. Moreover, it is also not clear from the limitations of claims 1 and 3-19 how the data results of the spectral simulation step are used to update the tentative model. Therefore, there appear to be missing steps in the claims.

Re: Claim Rejections - 35 USC § 102 – Jones Reference

17. Examiner agrees with Applicants' characterization of the Jones reference (see p.3 of the amendment filed 4/12/2007) that it "fails to disclose" the claimed features of:

"identifying connected strings of nodes within said tentative model, wherein a grid of azimuths is used to identify said connected strings of nodes" as recited in claim 1;

"specifying a grid of azimuths for nodes in said tentative model" as recited in claim 6;

“using said grid to identify connected strings of nodes within said tentative model” as recited in claim 6.

18. In particular, Examiner agrees with applicants' argument (see p.3 of the amendment filed 4/12/2007) that “Fig.2 of the present application depicts a grid of azimuths, where the azimuth is denoted by the line in each cell showing direction of maximum continuity. Nothing like this grid is shown or disclosed in Jones.” Examiner has interpreted the term “grid of azimuths” in the claims in light of Fig.2 and applicants' arguments.
19. Examiner notes that Jones expressly identifies connected nodes in the model from a 3D grid in Jones's Figure 2. Yet Jones's Fig.2 does not teach “each cell showing direction of maximum continuity.” The rejections based on Jones have been withdrawn.

### ***Conclusion***

20. The following prior art, made of record and not relied upon, is considered pertinent to applicant's disclosure.
21. The following references teach the use of a “grid of azimuths”, but none expressly do so in the framework of a geologic[al] model. None of the following references teach a grid of azimuths “where the azimuth is denoted by the line in each cell showing direction of maximum continuity.”
22. U.S. Patent 4,471,357 to Wu et al. (Teaches a “rectangular grid in the two-dimensional range and azimuth plane.” See col.12, lines 15-18).



23. Featherstone, W and Strangeways, H.J. "A Fast, Efficient Approach to Implementing SRDF Techniques." 8<sup>th</sup> Int'l Conf. on HF Radio Systems and Techniques. 2000. pp.123-126. (Teaches a "sparsely spaced grid of azimuths and elevations." See p.124, right column, 2<sup>nd</sup> paragraph of section titled "Applying Newton-Raphson ...").
24. Manikas, A. et al. "Study of the Detection and Resolution Capabilities of a One-Dimensional Array of Sensors by Using Differential Geometry." IEE Radar, Sonar and Navigation. Apr. 1994. Vol. 141, Issue 2, pp.83-92. (Teaches a "non-uniform grid of azimuths." See p.89, left column, in the paragraph following equation (44)).

***Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ayal I. Sharon whose telephone number is (571) 272-3714. The examiner can normally be reached on Monday through Thursday, and the first Friday of a bi-week, 8:30 am – 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached at (571) 272-3753.

Any response to this office action should be faxed to (571) 273-8300, or mailed to:

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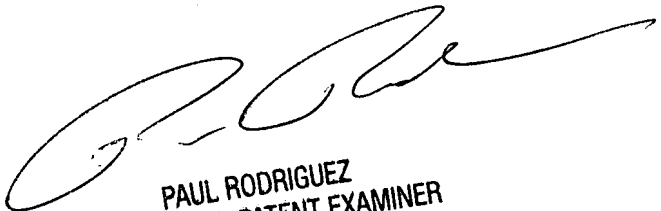
Art Unit: 2123

or hand carried to:

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Tech Center 2100 Receptionist, whose telephone number is (571) 272-2100.

Ayal I. Sharon  
Art Unit 2123  
May 20, 2007



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